

PATENT COOPERATION TREATY

AG

From the INTERNATIONAL SEARCHING AUTHORITY

PCT

To:

G.E. EHRLICH (1995) LTD.
Attn: Ehrlich, Gal
11 Menachem Begin Street
52521 Ramat Gan
ISRAEL

NOTIFICATION OF TRANSMITTAL OF
THE INTERNATIONAL SEARCH REPORT AND
THE WRITTEN OPINION OF THE INTERNATIONAL
SEARCHING AUTHORITY, OR THE DECLARATION

RECEIVED

24 DEC 2008

FILE No. 42454
G.E. EHRLICH (1995) LTD.

(PCT Rule 44.1)

Date of mailing
(day/month/year)

16/12/2008

①

Applicant's or agent's file reference

42454

FOR FURTHER ACTION

See paragraphs 1 and 4 below

International application No.

PCT/IB2008/050946

International filing date

(day/month/year)

14/03/2008

Applicant

EPOS TECHNOLOGIES LIMITED

1. ☒ The applicant is hereby notified that the international search report and the written opinion of the International Searching Authority have been established and are transmitted herewith.

Filing of amendments and statement under Article 19:

The applicant is entitled, if he so wishes, to amend the claims of the International Application (see Rule 46):

When? The time limit for filing such amendments is normally two months from the date of transmittal of the International Search Report.

Where? Directly to the International Bureau of WIPO, 34 chemin des Colombettes
1211 Geneva 20, Switzerland, Facsimile No.: (41-22) 338.82.70

For more detailed instructions, see the notes on the accompanying sheet.

2. ☐ The applicant is hereby notified that no international search report will be established and that the declaration under Article 17(2)(a) to that effect and the written opinion of the International Searching Authority are transmitted herewith.

3. ☐ **With regard to the protest** against payment of (an) additional fee(s) under Rule 40.2, the applicant is notified that:

- ☐ the protest together with the decision thereon has been transmitted to the International Bureau together with the applicant's request to forward the texts of both the protest and the decision thereon to the designated Offices.
☐ no decision has been made yet on the protest; the applicant will be notified as soon as a decision is made.

4. Reminders

Shortly after the expiration of **18 months** from the priority date, the international application will be published by the International Bureau. If the applicant wishes to avoid or postpone publication, a notice of withdrawal of the international application, or of the priority claim, must reach the International Bureau as provided in Rules 90bis.1 and 90bis.3, respectively, before the completion of the technical preparations for international publication.

The applicant may submit comments on an informal basis on the written opinion of the International Searching Authority to the International Bureau. The International Bureau will send a copy of such comments to all designated Offices unless an international preliminary examination report has been or is to be established. These comments would also be made available to the public but not before the expiration of 30 months from the priority date.

Within **19 months** from the priority date, but only in respect of some designated Offices, a demand for international preliminary examination must be filed if the applicant wishes to postpone the entry into the national phase **until 30 months** from the priority date (in some Offices even later); otherwise, the applicant must, **within 20 months** from the priority date, perform the prescribed acts for entry into the national phase before those designated Offices.

In respect of other designated Offices, the time limit of **30 months** (or later) will apply even if no demand is filed within 19 months.

See the Annex to Form PCT/IB/301 and, for details about the applicable time limits, Office by Office, see the *PCT Applicant's Guide*, Volume II, National Chapters and the WIPO Internet site.

Name and mailing address of the International Searching Authority



European Patent Office, P.B. 5818 Patentlaan 2
NL-2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
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Authorized officer

Karin Exner

NOTES TO FORM PCT/ISA/220

These Notes are intended to give the basic instructions concerning the filing of amendments under article 19. The Notes are based on the requirements of the Patent Cooperation Treaty, the Regulations and the Administrative Instructions under that Treaty. In case of discrepancy between these Notes and those requirements, the latter are applicable. For more detailed information, see also the *PCT Applicant's Guide*, a publication of WIPO.

In these Notes, "Article", "Rule", and "Section" refer to the provisions of the PCT, the PCT Regulations and the PCT Administrative Instructions, respectively.

INSTRUCTIONS CONCERNING AMENDMENTS UNDER ARTICLE 19

The applicant has, after having received the international search report and the written opinion of the International Searching Authority, one opportunity to amend the claims of the international application. It should however be emphasized that, since all parts of the international application (claims, description and drawings) may be amended during the international preliminary examination procedure, there is usually no need to file amendments of the claims under Article 19 except where, e.g. the applicant wants the latter to be published for the purposes of provisional protection or has another reason for amending the claims before international publication. Furthermore, it should be emphasized that provisional protection is available in some States only (see *PCT Applicant's Guide*, Volume I/A, Annexes B1 and B2).

The attention of the applicant is drawn to the fact that amendments to the claims under Article 19 are not allowed where the International Searching Authority has declared, under Article 17(2), that no international search report would be established (see *PCT Applicant's Guide*, Volume I/A, paragraph 296).

What parts of the international application may be amended?

Under Article 19, only the claims may be amended.

During the international phase, the claims may also be amended (or further amended) under Article 34 before the International Preliminary Examining Authority. The description and drawings may only be amended under Article 34 before the International Examining Authority.

Upon entry into the national phase, all parts of the international application may be amended under Article 28 or, where applicable, Article 41.

When?

Within 2 months from the date of transmittal of the international search report or 16 months from the priority date, whichever time limit expires later. It should be noted, however, that the amendments will be considered as having been received on time if they are received by the International Bureau after the expiration of the applicable time limit but before the completion of the technical preparations for international publication (Rule 46.1).

Where not to file the amendments?

The amendments may only be filed with the International Bureau and not with the receiving Office or the International Searching Authority (Rule 46.2).

Where a demand for international preliminary examination has been/is filed, see below.

How?

Either by cancelling one or more entire claims, by adding one or more new claims or by amending the text of one or more of the claims as filed.

A replacement sheet must be submitted for each sheet of the claims which, on account of an amendment or amendments, differs from the sheet originally filed.

All the claims appearing on a replacement sheet must be numbered in Arabic numerals. Where a claim is cancelled, no renumbering of the other claims is required. In all cases where claims are renumbered, they must be renumbered consecutively (Section 205(b)).

The amendments must be made in the language in which the international application is to be published.

What documents must/may accompany the amendments?

Letter (Section 205(b)):

The amendments must be submitted with a letter.

The letter will not be published with the international application and the amended claims. It should not be confused with the "Statement under Article 19(1)" (see below, under "Statement under Article 19(1)").

The letter must be in English or French, at the choice of the applicant. However, if the language of the international application is English, the letter must be in English; if the language of the international application is French, the letter must be in French.

NOTES TO FORM PCT/ISA/220 (continued)

The letter must indicate the differences between the claims as filed and the claims as amended. It must, in particular, indicate, in connection with each claim appearing in the international application (it being understood that identical indications concerning several claims may be grouped), whether

- (i) the claim is unchanged;
- (ii) the claim is cancelled;
- (iii) the claim is new;
- (iv) the claim replaces one or more claims as filed;
- (v) the claim is the result of the division of a claim as filed.

The following examples illustrate the manner in which amendments must be explained in the accompanying letter:

1. [Where originally there were 48 claims and after amendment of some claims there are 51]:
"Claims 1 to 29, 31, 32, 34, 35, 37 to 48 replaced by amended claims bearing the same numbers; claims 30, 33 and 36 unchanged; new claims 49 to 51 added."
2. [Where originally there were 15 claims and after amendment of all claims there are 11]:
"Claims 1 to 15 replaced by amended claims 1 to 11."
3. [Where originally there were 14 claims and the amendments consist in cancelling some claims and in adding new claims]:
"Claims 1 to 6 and 14 unchanged; claims 7 to 13 cancelled; new claims 15, 16 and 17 added." or
"Claims 7 to 13 cancelled; new claims 15, 16 and 17 added; all other claims unchanged."
4. [Where various kinds of amendments are made]:
"Claims 1-10 unchanged; claims 11 to 13, 18 and 19 cancelled; claims 14, 15 and 16 replaced by amended claim 14; claim 17 subdivided into amended claims 15, 16 and 17; new claims 20 and 21 added."

"Statement under article 19(1)" (Rule 46.4)

The amendments may be accompanied by a statement explaining the amendments and indicating any impact that such amendments might have on the description and the drawings (which cannot be amended under Article 19(1)).

The statement will be published with the international application and the amended claims.

It must be in the language in which the international application is to be published.

It must be brief, not exceeding 500 words if in English or if translated into English.

It should not be confused with and does not replace the letter indicating the differences between the claims as filed and as amended. It must be filed on a separate sheet and must be identified as such by a heading, preferably by using the words "Statement under Article 19(1)."

It may not contain any disparaging comments on the international search report or the relevance of citations contained in that report. Reference to citations, relevant to a given claim, contained in the international search report may be made only in connection with an amendment of that claim.

Consequence if a demand for international preliminary examination has already been filed

If, at the time of filing any amendments and any accompanying statement, under Article 19, a demand for international preliminary examination has already been submitted, the applicant must preferably, at the time of filing the amendments (and any statement) with the International Bureau, also file with the International Preliminary Examining Authority a copy of such amendments (and of any statement) and, where required, a translation of such amendments for the procedure before that Authority (see Rules 55.3(a) and 62.2, first sentence). For further information, see the Notes to the demand form (PCT/IPEA/401).

If a demand for international preliminary examination is made, the written opinion of the International Searching Authority will, except in certain cases where the International Preliminary Examining Authority did not act as International Searching Authority and where it has notified the International Bureau under Rule 66.1 bis(b), be considered to be a written opinion of the International Preliminary Examining Authority. If a demand is made, the applicant may submit to the International Preliminary Examining Authority a reply to the written opinion together, where appropriate, with amendments before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later (Rule 43 bis.1(c)).

Consequence with regard to translation of the international application for entry into the national phase

The applicant's attention is drawn to the fact that, upon entry into the national phase, a translation of the claims as amended under Article 19 may have to be furnished to the designated/elected Offices, instead of, or in addition to, the translation of the claims as filed.

For further details on the requirements of each designated/elected Office, see the *PCT Applicant's Guide*, Volume II.

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference 42454	FOR FURTHER ACTION <div style="text-align: right; font-size: small;">see Form PCT/ISA/220 as well as, where applicable, item 5 below.</div>	
International application No. PCT/IB2008/050946	International filing date (day/month/year) 14/03/2008	(Earliest) Priority Date (day/month/year) 14/03/2007
Applicant EPOS TECHNOLOGIES LIMITED		

This international search report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This international search report consists of a total of 6 sheets.

☒ It is also accompanied by a copy of each prior art document cited in this report.

1. Basis of the report

a. With regard to the **language**, the international search was carried out on the basis of:

- ☒ the international application in the language in which it was filed
☐ a translation of the international application into _____, which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b))

b. ☐ This international search report has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43.6bis(a)).

c. ☐ With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, see Box No. I.

2. ☐ **Certain claims were found unsearchable** (See Box No. II)

3. ☐ **Unity of invention is lacking** (see Box No III)

4. With regard to the **title**,

- ☒ the text is approved as submitted by the applicant
☐ the text has been established by this Authority to read as follows:

5. With regard to the **abstract**,

- ☒ the text is approved as submitted by the applicant
☐ the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box No. IV. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority

6. With regard to the **drawings**,

- a. the figure of the **drawings** to be published with the abstract is Figure No. 9
☐ as suggested by the applicant
☒ as selected by this Authority, because the applicant failed to suggest a figure
☐ as selected by this Authority, because this figure better characterizes the invention
b. ☐ none of the figures is to be published with the abstract

INTERNATIONAL SEARCH REPORT

International application No

PCT/IB2008/050946

A. CLASSIFICATION OF SUBJECT MATTER
 INV. H04R19/00 G06F3/043

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
 H04R G06F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	TW 235 010 B (TAIWAN CAROL ELECTRONICS CO LT [TW]) 21 June 2005 (2005-06-21) figure 2	1-36
A	US 2005/077102 A1 (BANTER CHAD A [US] ET AL) 14 April 2005 (2005-04-14) paragraphs [0001] - [0007], [0052], [0053]; figures 1a, 1b	1, 24-30
A	NEUMANN J J ET AL: "CMOS-MEMS membrane for audio-frequency acoustic actuation" SENSORS AND ACTUATORS A, ELSEVIER SEQUOIA S.A., LAUSANNE, CH, vol. 95, no. 2-3, 1 January 2002 (2002-01-01), pages 175-182, XP004377889 ISSN: 0924-4247 pages 175, 182	3-19



Further documents are listed in the continuation of Box C.



See patent family annex.

* Special categories of cited documents:

- *A* document defining the general state of the art which is not considered to be of particular relevance
- *E* earlier document but published on or after the international filing date
- *L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- *O* document referring to an oral disclosure, use, exhibition or other means
- *P* document published prior to the international filing date but later than the priority date claimed

- *T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- *X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- *Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- *G* document member of the same patent family

Date of the actual completion of the international search

8 December 2008

Date of mailing of the international search report

16/12/2008

Name and mailing address of the ISA/

European Patent Office, P.B. 5818 Patentlaan 2
 NL - 2280 HV Rijswijk
 Tel. (+31-70) 340-2040,
 Fax: (+31-70) 340-3016

Authorized officer

Righetti, Marco

INTERNATIONAL SEARCH REPORT

International application No

PCT/IB2008/050946

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	JUNGE S ET AL: "Simulation of capacitive micromachined ultrasonic transducers (cMUT) for low frequencies and silicon condenser microphones using an analytical model" 2003 IEEE ULTRASONICS SYMPOSIUM PROCEEDINGS. HONOLULU, HAWAII, OCT. 5 20031005; 20031005 - 20031008 NEW YORK, NY : IEEE, US, vol. 1, 5 October 2003 (2003-10-05), pages 485-488, XP010701172 ISBN: 978-0-7803-7922-0 page 487	3-19
A	WO 2007/004119 A (KONINKL PHILIPS ELECTRONICS NV [NL]; PHILIPS INTELLECTUAL PROPERTY [DE]) 11 January 2007 (2007-01-11) page 14, lines 4-19; figures 8,9	3-19
A	JIAN CAI ET EL: "A Study on Packaging of PZT MEMS Microphone" 2005 ELECTRONICS COMPONENTS AND TECHNOLOGY CONFERENCE, LAKE BUENA VISTA, FL, USA, [Online] - 3 June 2005 (2005-06-03) pages 1077-1080, XP002488699 piscataway, NJ, USA, IEEE ISBN: 978-0-7803-8907-6 Retrieved from the Internet: URL: http://ieeexplore.ieee.org/ie15/9844/31024/01441405.pdf the whole document	22,23, 33,36
X	WO 2006/100682 A (EPOS TECHNOLOGIES LTD [GB]; RAIF RAN [IL]; KEDEM NOAM [IL]; KOKAREV MI) 28 September 2006 (2006-09-28) page 30, line 11 - page 33, line 17; figures 13-15 page 37, lines 1-3; claims 8,27	37-51, 54-68
A	WO 01/35329 A (ITPEN LTD [IL]; SHOLEV MORDEHAI [IL]) 17 May 2001 (2001-05-17) abstract; figures 1b,1c	39-41, 47,58
A	US 2004/032399 A1 (SEKIGUCHI HIDENORI [JP] ET AL) 19 February 2004 (2004-02-19) paragraphs [0061] - [0063]; figures 3a-3c	51,55,60
A	US 2003/151596 A1 (MOYNE WILLIAM P [US] ET AL MOYNE WILLIAM P [US] ET AL) 14 August 2003 (2003-08-14) abstract; figures 1-4d	37-68

INTERNATIONAL SEARCH REPORT

International application No.
PCT/IB2008/050946

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☒ As all required additional search fees were timely paid by the applicant, this international search report covers allsearchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fees, this Authority did not invite payment of additional fees.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.
- ☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
- ☒ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-36

MEMS microphone comprising a mesh covering the open front side of the case.

2. claims: 37-68

Acoustic positioning system comprising a receiver which makes use of two MEMS microphones sensitive to ultrasound waves

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/IB2008/050946

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
TW 235010	B	21-06-2005	NONE	
US 2005077102	A1	14-04-2005	CN 1883242 A EP 1685740 A2 JP 2007510326 T KR 20060085958 A WO 2005039234 A2	20-12-2006 02-08-2006 19-04-2007 28-07-2006 28-04-2005
WO 2007004119	A	11-01-2007	CN 101213142 A KR 20080023313 A	02-07-2008 13-03-2008
WO 2006100682	A	28-09-2006	AU 2006225986 A1 CA 2601313 A1 CN 101180601 A EP 1861771 A2 JP 2008535051 T KR 20070114397 A US 2008166048 A1	28-09-2006 28-09-2006 14-05-2008 05-12-2007 28-08-2008 03-12-2007 10-07-2008
WO 0135329	A	17-05-2001	AR 028185 A1 AT 274723 T AU 778324 B2 AU 1073000 A CA 2390362 A1 DE 69919759 D1 DE 69919759 T2 EP 1228480 A1 JP 2003514310 T MX PA02004592 A TW 550512 B	30-04-2003 15-09-2004 25-11-2004 06-06-2001 17-05-2001 30-09-2004 01-09-2005 07-08-2002 15-04-2003 10-09-2004 01-09-2003
US 2004032399	A1	19-02-2004	JP 4146188 B2 JP 2004078496 A	03-09-2008 11-03-2004
US 2003151596	A1	14-08-2003	GB 2388077 A	05-11-2003

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

PCT

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY
(PCT Rule 43*bis*.1)

To:

see form PCT/ISA/220

Date of mailing
(day/month/year) see form PCT/ISA/210 (second sheet)

Applicant's or agent's file reference
see form PCT/ISA/220

FOR FURTHER ACTION
See paragraph 2 below

International application No.
PCT/IB2008/050946

International filing date (day/month/year)
14.03.2008

Priority date (day/month/year)
14.03.2007

International Patent Classification (IPC) or both national classification and IPC
INV. H04R19/00 G06F3/043

Applicant
EPOS TECHNOLOGIES LIMITED

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☒ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☒ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☒ Box No. VII Certain defects in the international application
- ☒ Box No. VIII Certain observations on the international application

2. FURTHER ACTION

If a demand for international preliminary examination is made, this opinion will usually be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1*bis*(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA:



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D-80298 Munich
Tel. +49 89 2399 - 0 Tx: 523656 epmu d
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Date of completion of
this opinion

see form
PCT/ISA/210

Authorized Officer

Righetti, Marco

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**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.
PCT/IB2008/050946

Box No. I Basis of the opinion

1. With regard to the **language**, this opinion has been established on the basis of:
 - ☒ the international application in the language in which it was filed
 - ☐ a translation of the international application into , which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1 (b)).
2. ☐ This opinion has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43bis.1(a))
3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:
 - a. type of material:
 - ☐ a sequence listing
 - ☐ table(s) related to the sequence listing
 - b. format of material:
 - ☐ on paper
 - ☐ in electronic form
 - c. time of filing/furnishing:
 - ☐ contained in the international application as filed.
 - ☐ filed together with the international application in electronic form.
 - ☐ furnished subsequently to this Authority for the purposes of search.
4. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
5. Additional comments:

Box No. II Priority

1. ☒ The validity of the priority claim has not been considered because the International Searching Authority does not have in its possession a copy of the earlier application whose priority has been claimed or, where required, a translation of that earlier application. This opinion has nevertheless been established on the assumption that the relevant date (Rules 43bis.1 and 64.1) is the claimed priority date.
2. ☐ This opinion has been established as if no priority had been claimed due to the fact that the priority claim has been found invalid (Rules 43bis.1 and 64.1). Thus for the purposes of this opinion, the international filing date indicated above is considered to be the relevant date.
3. Additional observations, if necessary:

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.
PCT/IB2008/050946

Box No. IV Lack of unity of invention

1. ☒ In response to the invitation (Form PCT/ISA/206) to pay additional fees, the applicant has, within the applicable time limit:
- ☒ paid additional fees
 - ☐ paid additional fees under protest and, where applicable, the protest fee
 - ☐ paid additional fees under protest but the applicable protest fee was not paid
 - ☐ not paid additional fees
2. ☐ This Authority found that the requirement of unity of invention is not complied with and chose not to invite the applicant to pay additional fees.
3. This Authority considers that the requirement of unity of invention in accordance with Rule 13.1, 13.2 and 13.3 is
- ☐ complied with
 - ☒ not complied with for the following reasons:
see separate sheet
4. Consequently, this report has been established in respect of the following parts of the international application:
- ☒ all parts.
 - ☐ the parts relating to claims Nos.

Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	<u>1-36, 38-43, 47, 51-68</u>
	No: Claims	<u>37, 44-46, 48-50</u>
Inventive step (IS)	Yes: Claims	<u>52, 53</u>
	No: Claims	<u>1-51, 54-68</u>
Industrial applicability (IA)	Yes: Claims	<u>1-68</u>
	No: Claims	

2. Citations and explanations

see separate sheet

Box No. VII Certain defects in the international application

The following defects in the form or contents of the international application have been noted:

see separate sheet

Box No. VIII Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

see separate sheet

Re Item IV.

- 1 This Authority considers that there are two separate inventions covered by the claims indicated as follows:

Group 1: **Claims 1-36**, directed to a MEMS microphone comprising a mesh covering the open front side of the case.

Group 2: **Claims 37-68**, directed to an acoustic positioning system comprising a receiver which makes use of two MEMS microphones sensitive to ultrasound waves.

- 1.1 The groups of claims are not linked by common or corresponding special technical features and define two different inventions not linked by a single general inventive concept. Thus, the application does not meet the requirements of unity of invention as defined in Rules 13.1 and 13.2 PCT.

Re Item V.

- 2 Reference is made to the following documents:

- D1: TW 235 010 B (TAIWAN CAROL ELECTRONICS CO LT [TW]) 21 June 2005 (2005-06-21)
- D2: US 2005/077102 A1 (BANTER CHAD A [US] ET AL) 14 April 2005 (2005-04-14)
- D3: NEUMANN J J ET AL: "CMOS-MEMS membrane for audio-frequency acoustic actuation" SENSORS AND ACTUATORS A, ELSEVIER SEQUOIA S.A., LAUSANNE, CH, vol. 95, no. 2-3, 1 January 2002 (2002-01-01), pages 175-182, XP004377889 ISSN: 0924-4247
- D4: JUNGE S ET AL: "Simulation of capacitive micromachined ultrasonic transducers (cMUT) for low frequencies and silicon condenser microphones using an analytical model" 2003 IEEE ULTRASONICS SYMPOSIUM PROCEEDINGS. HONOLULU, HAWAII, OCT. 5 20031005; 20031005 - 20031008 NEW YORK, NY : IEEE, US, vol. 1, 5 October 2003 (2003-10-05), pages 485-488, XP010701172 ISBN: 978-0-7803-7922-0
- D5: WO 2007/004119 A (KONINKL PHILIPS ELECTRONICS NV [NL]; PHILIPS INTELLECTUAL PROPERTY [DE] 11 January 2007 (2007-01-11)

- D6: JIAN CAI ET EL: "A Study on Packaging of PZT MEMS Microphone" 2005 ELECTRONICS COMPONENTS AND TECHNOLOGY CONFERENCE, LAKE BUENA VISTA, FL, USA, [Online] - 3 June 2005 (2005-06-03) pages 1077-1080, XP002488699 piscataway, NJ, USA, IEEE ISBN: 978-0-7803-8907-6 Retrieved from the Internet: URL: <http://ieeexplore.ieee.org/iel5/9844/31024/01441405.pdf>>
- D7: WO 2006/100682 A (EPOS TECHNOLOGIES LTD [GB]; RAIF RAN [IL]; KEDEM NOAM [IL]; KOKAREV MI) 28 September 2006 (2006-09-28)
- D8: WO 01/35329 A (ITPEN LTD [IL]; SHOLEV MORDEHAI [IL]) 17 May 2001 (2001-05-17)
- D9: US 2004/032399 A1 (SEKIGUCHI HIDENORI [JP] ET AL) 19 February 2004 (2004-02-19)
- D10: US 2003/151596 A1 (MOYNE WILLIAM P [US] ET AL MOYNE WILLIAM P [US] ET AL) 14 August 2003 (2003-08-14)

INVENTION 1

- 3 The subject-matter of **claim 1** does not involve an inventive step in the sense of Article 33(3) PCT.

The document D1 is regarded as being the closest prior art to the subject-matter of claim 1, and discloses:

A MEMS microphone (Fig. 2) comprising:

- a) a case (ref. 300) with an open front side;
- b) a MEMS membrane (ref. 34, 35) mounted on one face of a base (ref. 30-33), the base being mounted inside the case on a substantially closed side; and
- c) a protective acoustic cover covering the front side (clearly visible in Fig. 2), substantially transparent acoustically to at least some of a range of operating frequencies at which the microphone is sensitive.

The subject-matter of claim 1 therefore differs from this known device in that the protective acoustic cover is a mesh.

Realizing a protective acoustic cover by means of a mesh is however well known in the field of microphones, and does not involve the exercise of any inventive skill (see

also D2, Figs. 1a, 1b; par. [0001]-[0007]).

4 Regarding dependent **claims 2-36**:

Regarding **claim 2**, mounting an amplifier in the case does not involve any inventive step.

Regarding **claims 3-19**, determining the adjustments which are necessary for making a MEMS microphone as the one shown in D1 also sensitive to frequencies higher than 20KHz is within the scope of a person skilled in the art (see also D3, par "1. Introduction" and "6. Summary"; D4, par "IV. Simulation of Silicon Condenser Microphones", and Fig. 6; D5, Figs. 8, 9; page 14, lines 4-19).

The subject matter of **claim 20** (membrane facing the front side), **claims 34, 35** (symmetric placement of the microphone) is disclosed by document D1.

Regarding **claims 21-23, 33, 36** projecting a packaging so as to avoid resonances within the operating frequency band is within the scope of a person skilled in the art (see also D6, par. "Abstract"; page 1078, left column, last paragraph - right column, first paragraph; page 1078, right column).

Regarding the subject matter of **claims 24-30** (mesh), determining the necessary characteristics of a mesh is within the scope of a person skilled in the art (see also D2, par. [0051]-[0053]).

Regarding **claims 31, 32**, providing a solid area for placing and picking does not involve the exercise of any inventive activity

INVENTION 2

5 The subject-matter of **claim 37** is not new in the sense of Article 33(2) PCT.

The document D7 in fact discloses:

An acoustic positioning system (Figs. 13, 14) comprising:

a) a receiver (Fig. 13, ref. 1300; page 30, lines 11-13) comprising at least two MEMS microphones (1330, 1420; page 30, lines 16-18; claim 27) that generates a signal in response to ultrasound waves that it receives;

b) an implement (1410; page 33, lines 5-6) that moves relative to the receiver on a positioning surface on top of which the receiver rests, and comprises at least one ultrasound transmitter that transmits ultrasound waves to the receiver; and

c) a controller that uses the signal to track a position of the implement on the positioning surface (1450; page 33, lines 7-8).

6 Regarding dependent **claims 38-68**:

Regarding the subject matter of **claim 38, 42, 43** proper setting and positioning of the microphones of the acoustic positioning system is within the scope of a person skilled in the art (see also document D10, Fig. 4d).

Regarding the additional subject matter of **claims 39-41, 47, 58** (inclined front side) see document D8, Figs. 1b, 1c.

Document D7 further discloses the subject matter of **claims 44, 45** (outer surface of the microphone flush with the surface of the receiver: see Fig. 13), **claim 46** (convexly curved surface: see fig. 13), **claims 48, 49** (infrared transmitters and synchronization: Fig. 15, page 37, lines 1-3; claim 8), **claim 50** (infrared window between microphones: Fig. 13).

Regarding the subject matter of **claim 51** (microphone forward of the infrared window), see document D9, Figs. 3A-3C, par. [0061]-[0063].

Regarding the subject matter of **claim 54**, using RF instead of Infrared transmitters for synchronizing the system does not involve the exercise of any inventive skill.

The subject matter of **claims 55, 60** relates to a well known method for mounting microphones, and receivers in general, to as to get specific directional characteristics (see document D9, Figs. 3A-3C, par. [0061]-[0063]).

Regarding **claims 56, 62, 63, 64, 65, 67, 68** making use of protective grills for the microphones does not involve the exercise of any inventive skill (see also D2, Figs.

1a, 1b; par. [0001]-[0007], [0052]-[0053]).

Regarding **claim 57**, a person skilled in the art would recurr to certain MEMs microphones according to circumstances, without the exercise of any inventive skill.

Regarding **claims 59, 61, 66** making use of electronic printed circuit boards so as to simplify the assembly of the system does not involve the exercise of any inventive activity (see also D7, page 32, lines 7-11).

- 6.1 The combination of the features of dependent **claims 52, 53** is neither known from, nor rendered obvious by, the available prior art. No teachings can in fact be found in prior art which would lead a person skilled in the art to set the microphones of the system shown in D7 forward of the central optical window, and to add other optical windows on adjacent sides of the receiver, thus arriving at the same subject matter of claim 1.

Re Item VII.

- 7.1 Independent claims 1, 37 is not in the two-part form in accordance with Rule 6.3(b) PCT.
- 7.2 The features of the claims are not provided with reference signs placed in parentheses (Rule 6.2(b) PCT).
- 7.3 Contrary to the requirements of Rule 5.1(a)(ii) PCT, the relevant background art disclosed in the documents D1, D7 is not mentioned in the description, nor are these documents identified therein.

Re Item VIII.

- 8 The **claims 3-19, 27-30, 38, 68** do not meet the requirements of Article 6 PCT, as they attempt to define the subject-matter in terms of the result to be achieved, without providing the technical features necessary for achieving this result.

Possible steps after receipt of the international search report (ISR) and written opinion of the International Searching Authority (WO-ISA)

General information

For all international applications filed on or after 01/01/2004 the competent ISA will establish an ISR. It is accompanied by the WO-ISA. Unlike the former written opinion of the IPEA (Rule 66.2 PCT), the WO-ISA is not meant to be responded to, but to be taken into consideration for further procedural steps. This document explains about the possibilities.

Amending claims under Art. 19 PCT

Within 2 months after the date of mailing of the ISR and the WO-ISA the applicant may file amended claims under Art. 19 PCT directly with the International Bureau of WIPO. The PCT reform of 2004 did not change this procedure. For further information please see Rule 46 PCT as well as form PCT/ISA/220 and the corresponding Notes to form PCT/ISA/220.

Filing a demand for international preliminary examination

In principle, the WO-ISA will be considered as the written opinion of the IPEA. This should, in many cases, make it unnecessary to file a demand for international preliminary examination. If the applicant nevertheless wishes to file a demand this must be done before expiry of 3 months after the date of mailing of the ISR/ WO-ISA or 22 months after priority date, whichever expires later (Rule 54bis PCT). Amendments under Art. 34 PCT can be filed with the IPEA as before, normally at the same time as filing the demand (Rule 66.1 (b) PCT).

If a demand for international preliminary examination is filed and no comments/amendments have been received the WO-ISA will be transformed by the IPEA into an IPRP (International Preliminary Report on Patentability) which would merely reflect the content of the WO-ISA. The demand can still be withdrawn (Art. 37 PCT).

Filing informal comments

After receipt of the ISR/WO-ISA the applicant may file informal comments on the WO-ISA directly with the International Bureau of WIPO. These will be communicated to the designated Offices together with the IPRP (International Preliminary Report on Patentability) at 30 months from the priority date. Please also refer to the next box.

End of the international phase

At the end of the international phase the International Bureau of WIPO will transform the WO-ISA or, if a demand was filed, the written opinion of the IPEA into the IPRP, which will then be transmitted together with possible informal comments to the designated Offices. The IPRP replaces the former IPER (international preliminary examination report).

Relevant PCT Rules and more information

Rule 43 PCT, Rule 43bis PCT, Rule 44 PCT, Rule 44bis PCT, PCT Newsletter 12/2003, OJ 11/2003, OJ 12/2003

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